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673.

S P R U C E B U D W O R M C O N T R O L P L A N

for 1950

in

O R E G O N A N D W A S H I N G T O N

PREPARED BY REPRESENTATIVES OF THE FOLLOWING ORGANIZATIONS FOLLOWING A PUBLIC HEARING IN PORTLAND, OREGON, ON SEPTEMBER 8, 1949.

Oregon State Board of Forestry
Oregon Extension Service
Washington State Division of Forestry
Washington Forest Fire Association
Forest Conservation Committee of Pacific Northwest Forest Industries
Western Pine Association
Western Forestry and Conservation Association
Western Forest Industries Association
Keep Oregon Green
Keep Washington Green
Associated Forest Industries of Oregon
Willamette Valley Tree Farms
Stockmen and ranchers in the Blue Mountains
Chambers of Commerce in the Blue Mountains
U. S. Forest Service
U. S. Bureau of Land Management
U. S. Indian Service
U. S. Bureau of Entomology and Plant Quarantine

Portland, Oregon
October 1, 1949

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Entomology and Plant Quarantine
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SPRUCE BUDWORM CONTROL PLAN FOR 1950 IN OREGON AND WASHINGTON

THE SPRUCE BUDWORM PROBLEM

The spruce budworm epidemic in the Douglas-fir and white fir forests of Oregon and Washington has reached the alarming size of 2,267,000 acres, and wholesale destruction of timber is threatened. With a small beginning in 1944, the epidemic had increased to 908,000 acres by 1947, and to 1,446,000 acres by 1948 (Chart 1). Now practically all the fir timber in the Blue Mountains is infested. Serious outbreaks of the budworm also are present in the highly important commercial stands of western Oregon and in the Oregon Cascades. Only the forests of western Washington have so far escaped epidemic infestation of the budworm.

The spruce budworm kills trees slowly by several successive years of feeding on the foliage and buds. In the present epidemic the first tree killing occurred in 1947, but was confined to scattered trees. Defoliation in 1948 caused general killing on 9000 acres. Extensive killing on 887,000 acres of forest that was heavily defoliated in 1949 is expected, but the exact amount of the loss will not be known until 1950. Unless the control program initiated in the spring of 1949 is greatly expanded and aggressively carried out, vast losses of timber within the next 2 or 3 years seem inevitable.

In the following discussion, the budworm situation is briefly outlined and a detailed plan for controlling the epidemic is given. Because of the immense size of the infested area and the short time available for control, it is not feasible to attempt to control the entire infestation in a single year. Even though the proposed control program for 1950 covers only the most critically infested areas, it will be a vast undertaking and will tax the best cooperative efforts of private, city, county, state and federal organizations.

CONTROL MEASURES ALREADY INITIATED

In the spring of 1949 a start was made in the fight to suppress the budworm epidemic. In western Oregon, 161,000 acres of valuable Douglas-fir were treated by aerial spraying of DDT at an over-all cost of $1.20 per acre. On the eastern slopes of Mount Hood, 106,000 acres were similarly treated. Approximately 97 percent of the spruce budworm larvae were killed, thus halting the epidemic and saving the trees on the treated areas.

The experience gained in 1949 provides a firm basis for planning a much larger control program in 1950. Contractual procedures have been established; cooperative financing and administration under the state and federal forest pest control acts have been clarified; airplanes and spraying equipment have been rigorously tested; personnel have been trained; and numerous organizational details have been worked out.

Time is a limiting factor in the amount of control work that can be done in a single year because the budworm is vulnerable only for a short time in May and June. On any given area the period for effective spraying lasts only about two weeks. The occurrence of this period varies with differences in elevation, aspect, and locality, but the maximum region-wide control period does not exceed one month.

1949 SURVEY FINDINGS

The budworm situation reported here was determined from a comprehensive aerial and ground survey conducted during the period June 15 to August 31, 1949. This cooperative survey, participated in by more than 100 private, state, and federal foresters and entomologists, covered all the fir forests in Oregon and Washington. Some 20,000 miles were flown in the aerial survey, and 3,634 check plots were examined in the ground survey.

The detailed findings of the spruce budworm survey of 1949 are given in a recently issued mimeographed report. Insofar as they relate to control needs, these findings are restated in the present report in the section "Description of Proposed Control Units" and in the accompanying tables, chart and map. Epidemic outbreaks of the budworm, exclusive of the areas sprayed in 1949, are recorded as follows:

(1)	Western Oregon----------	89,000 acres
(2)	Eastern Cascades in Oregon---------	40,000 acres
(3)	Blue Mountains in Oregon----------	1,968,000 acres
(4)	Blue Mountains in Washington------	170,000 acres
	Total	2,267,000 acres

In this report the infested acreages are grouped into "light" and "heavy" categories. This classification refers to the relative degree of defoliation rather than the population of the budworm. On the "light" areas no tree killing is expected for at least one year. On the "heavy" areas tree killing is in progress and ranges up to nearly complete kill on some areas. There are 887,000 acres of "heavy" infestation and 1,380,000 acres of "light" infestation.

VALUES AT STAKE

The major threat of the budworm is to the giant forest industries that are dependent upon the Douglas-fir and white fir forests. The seriously infested timber, considerable amounts of which are already dead or dying, totals some 12 billion board feet conservatively valued at $48,000,000 standing in the forest. It would be worth many times as much when harvested and manufactured. Even more extensive and more valuable stands are very likely to become infested unless the epidemic is halted. It is impossible to evaluate fully what the loss of timber on such a vast scale would mean in terms of local community, state, and national welfare.

Also of prime importance is the fire hazard created by the dead and dying trees. Private and public foresters state that on extensive areas in the Blue Mountains the fire hazard doubled in 1949 due to the budworm. In a year or two the increased fire hazard may make necessary extreme precautionary measures during the dry season; such as, restricting hunting, fishing, and other recreational activities; limiting grazing and other special uses of forested areas; and closing down logging operations. Certainly the stage is set for a maximum fire problem. If the outbreak is allowed to continue, it is probable that the increased costs of fire prevention and suppression will, in a few years, far exceed the estimated cost of spraying to control the budworm.

Heavy kill of dense fir stands, in all probability followed by fire, would contribute much to flood damage, soil erosion, and the lessening of water supplies. Irrigation systems having their source in the moist north slope fir forests may be greatly impaired if the anticipated tree killing occurs. The potential damage to water supplies alone runs into untold millions of dollars, and already has caused real concern to cities near the affected areas.

RECOMMENDATIONS

It is evident that control of the spruce budworm in Oregon and Washington is a huge undertaking. Much can be accomplished in one year. By an all-out effort the most critically infested areas can be sprayed and timber losses kept to a minimum. The prospects of bringing the outbreak under complete control in a 2- to 3-year period are good, provided aggressive action is taken in 1950. The committee recommends the following control program.

Areas to be Treated

Since it is not practical to treat the entire infested area in a single year, it is necessary to estimate how much can be done and then apply priority ratings on the basis of the value at stake, the degree of infestation, and the amounts of federal and state monies which are made available. On the basis of the experience gained in 1949, it is estimated that the combined state and federal agencies could efficiently conduct projects totaling one million acres during the 1950 season. Accordingly, a program totaling approximately that acreage has been prepared and is presented in Table 2.

In selecting areas for treatment under this program, three types of infestation were given first priority, as follows:

(1) Infested areas near or adjacent to control areas of 1949, which, if left uncontrolled, would reinfest the controlled areas.

(2) Areas of new infestation in Western Oregon and in the Eastern Cascades which would serve as centers of further spread in these localities.

(3) Areas in the Blue Mountains region which are heavily infested and on which tree killing is in progress.

The proposed 1950 program will require the treatment of 999,670 acres of which 646,190 acres (64.6%) are federal, 349,550 acres (35.0%) are private, and 3,930 acres (0.4%) are state and county lands. The bulk of the area (959,620 acres) is in Oregon and the remainder (40,050 acres) is in Washington.

Apportionment of Project Costs

The proposed apportionment of the costs among the various landowners is based upon the formula used on the Eugene project in 1949 and is as follows:

(1) Federal government - 100 percent of the cost of treatment on federal lands and 25 percent of the cost of treatment on private lands.

(2) States of Oregon and Washington - 100 percent of the cost of treatment of state and county lands and 50 percent of the cost of treatment of private lands.

(3) Private landowners - 25 percent of the cost of treatment on their holdings.

The entire cost of the proposed control program, on the basis of the $1.20 per acre cost in 1949, is $1,199,604. As shown in table 3 the federal share of this amount would be $880,293, the State of Oregon's share would be $196,590, the State of Washington's share would be $17,856, and the private landowner's share would be $104,865.

Project Administration

The control projects conducted in 1949 proved to be economical, efficient and effective, and it is recommended that the same general procedures be followed in 1950. Contracting for materials and services to the maximum possible extent is recommended because of the resulting economy and the minimum disruption of other forest activities. Supervision and coordination of the technical phases of the control work by the U. S. Bureau of Entomology and Plant Quarantine is recommended. Division of administrative responsibility between the federal government and the states is recommended to make the best use of personnel and administrative facilities locally available.

Under the Oregon Insect Pest Act the state forester is required to control any forest insect infestations on state, county and private lands that threaten the timber resources of the state. On September 21, 1949, the State Board of Forestry established zones of infestation encompassing the budworm-infested forests of Oregon. Of the area proposed for treatment in Oregon, 325,800 acres are in state, county and private ownership. For the most part these acreages are scattered and are intermingled with federally owned lands. It is proposed, therefore, that the administration of the control projects for 1950 again be divided between the federal

government and the state with control factors the primary consideration. Under this plan, project administration would be divided about equally by practical control units with the state administering those units containing the larger percentages of private, state and county holdings.

In Table 4, the proposed administrative division of project units is presented with acreages shown by ownerships. Six units, comprising 518,990 acres are to be treated by the federal government; and five units, comprising 480,680 acres are to be treated by the State of Oregon. Since there is no forest insect control law in Washington, all control in that state presumably will be done by the federal government on a reimbursement basis.

Early Financing a Necessity

In 1949 there was a prolonged delay in obtaining funds to pay for the federal share of the spruce budworm control projects in Oregon. Appropriations were delayed to the point that the entire control program would have had to be abandoned had not the State of Oregon advanced funds and the spray contractors made the necessary preparations for the job on the gamble that federal funds would ultimately be made available.

For a program of the magnitude of the 1950 proposal, it is vital that the required funds be made available and the contracts awarded at the earliest possible date. Insecticide must be stock-piled over a period of months and much aerial spraying equipment must be assembled at heavy expense. Contractors and suppliers cannot be expected to make the necessary advance preparations until they can be given definite assurance that federal, state and private funds will be available. Without these advance preparations, the control program cannot be carried out and the budworm epidemic will continue to spread and destroy.

DESCRIPTION OF PROPOSED CONTROL UNITS

The following discussion is presented to give the unit by unit basis for the over-all control program presented in the preceding sections of this report. The map which is bound with this report shows the location of these 13 units. The numbers given in the text correspond to those on the map. Acreages, ownerships and spraying costs are tabulated in the four tables which follow the text.

Western Oregon Area

The budworm infestation in western Oregon falls into three major units each comprised of several local outbreak centers. Timber values on or adjacent to the infested stands are the highest in the region. An extensive program to control the budworm in western Oregon was initiated at a cost of $193,000 in the spring of 1949 with outstanding success. Completion of this program by the treatment of all infested areas is recommended to protect the infested timber and to prevent spread to other stands.

The total infested acreage on the western Oregon area is 88,640 acres of which 16,160 acres already are critically defoliated. Timber volume on the infested areas is variable, but averages about 20,000 board feet per acre. At $10 per thousand board feet the stumpage value of the infested timber is $17,728,000. Of vastly greater value is the surrounding but as yet unaffected timber upon which the forest industry of the region depends for continued large-scale production.

(1) McKenzie-Willamette Unit - Five local centers of infestation totaling 68,160 acres were discovered along the headwaters of the McKenzie and North Willamette rivers during the survey of 1949. Infestation has reached the critical stage on 14,240 acres. The infested area is 100 percent national forest land. Predominantly, the outbreak is in advanced second growth of commercial size. Very large acreages of virgin timber adjoin to the west. Control is urgently needed to protect the timber already infested and to prevent spread to adjoining timber.

(2) Eugene-Oakridge Unit - Four scattered islands of infestation totaling 10,240 acres remain in the vicinity of the 161,000-acre area that was sprayed in 1949. Ownership of the currently infested area is 53.1 percent (5,440 acres) national forest, 20.5 percent (2,100 acres) O and C, and 26.4 percent (2,700 acres) private. The mopping up of these centers is essential to complete the control job already begun.

(3) Roseburg Unit - Seven small centers of budworm infestation north of Roseburg were discovered in 1949. The infested trees are small and of low quality. Infestation is light except for 480 acres. Ownership is 93.7 percent (9,580 acres) state and private and 6.3 percent (640 acres) O and C. The importance of this outbreak is in the threat to nearby stands of great commercial value. As a precautionary measure, it is advisable to suppress the outbreak in its present early stage.

Eastern Oregon Cascades Area

There are two logical control units in the fir forests on the eastern slopes of the Cascade Range in Oregon. Timber values per acre are moderately high. In the spring of 1949 a total of $127,000 was invested in control of the budworm with a resulting 97 percent kill on the treated area. Completion of this control project and extension of control to the small unit discovered in 1949 is recommended.

The total infested acreage on the Eastern Oregon Cascades area is 39,990, all lightly infested and consists of the Mount Hood and Deschutes units. Timber volume of fir averages about 5,000 board feet per acre with a stumpage value of approximately $3.00 per thousand board feet. The total value of the infested fir is $600,000. Adjoining the infested timber are threatened merchantable forests which are needed to keep alive the local forest industries until younger stands reach usable size.

(4) Mount Hood Unit - Budworm infestation on the Mount Hood unit consists of two remaining centers of light infestation totaling 32,990 acres adjacent to the 106,000-acre treated area. The infestod area is 77.4 percent (25,520 acres) Indian lands, 21.2 percent (7,000 acres) national forest lands, and 1.4 percent (470 acres) private lands. Control is advocated to complete the program begun in 1949.

(5) Deschutes Unit - Three centers of relatively light defoliation totaling 7,000 acres were found in the vicinity of Sisters, Oregon, in 1949. Ownership is 86.7 percent (6,070 acres) national forest and 13.3 percent (930 acres) private. Control of this potentially serious outbreak is recommended primarily because of its location relative to the Mount Hood and western Oregon control projects.

Blue Mountains Area - Oregon

Practically all of the fir forests in the Blue Mountains are involved in the budworm epidemic that has steadily been building up since 1944. Severe killing of the defoliated trees is in progress. Continuation of the outbreak will seriously deplete the forest resource of the area and

will lead to other serious consequences. Already, because of the dead and dying timber, the forest fire hazard has doubled on extensive areas. Recreational values are being depleted and forested watersheds are threatened which provide barely enough water for irrigation and municipal use.

The present infestation covers some 1,968,000 acres. Trees are already being killed on 831,000 acres. The average volume of fir on the total infested areas is about 5,000 board feet per acre. At $3 per thousand board feet the stumpage value is approximately $29,520,000. In addition, extensive stands of young trees are seriously attacked.

This epidemic has reached the stage where only an all-out program of control will be of much avail. It is proposed that control in 1950 be directed against all areas where tree killing is in progress and that the less heavily infested areas be treated at the earliest opportunity after 1950.

(6) South Umatilla Unit - The commercially important mixed fir forests of this unit are among the most serious attacked in the region. A total of 489,370 acres is infested. The infestation has been steadily increasing in extent and intensity since 1944. Control on 295,960 acres in two main blocks - Kinzua and Ukiah - is recommended for 1950. Ownership of the area proposed for control is 60.5 percent (178,940 acres) national forest, 1.4 percent (4,060 acres) public domain, and 38.1 percent (112,620 acres) state and private.

(7) North Umatilla Unit - The fir stands of this unit, like those on the South Umatilla Unit, are extensively and critically infested with the budworm. The fir timber, although less accessible, makes up a larger percentage of the total stand than on the South Umatilla Unit. The watersheds of several communities and irrigation districts are seriously attacked. The dense fir stands of the intensively used Tollgate recreational area are nearing complete destruction.

A total of 516,420 acres is infested on the North Umatilla Unit. Control on 288,940 acres in one main block is recommended for 1950. Ownership of the area proposed for control is 61.5 percent (177,850 acres) national forest, 0.5 percent (1,250 acres) public domain, 0.6 percent (1,710 acres) Indian, and 37.0 percent (106,820 acres) state and private.

(8) LaGrande Unit - A total of 288,020 acres on and adjacent to the Whitman National Forest is infested. The infestation is mainly in second-growth stands; hence, the values involved are chiefly the forests of the future. Control on 100,050 acres in two main blocks - Catherine

Creek and Starkey - is recommended for 1950. Ownership of the area proposed for control is 51.9 percent (51,970 acres) national forest, 1.2 percent (1,150 acres) public domain, 46.9 percent (46,930 acres) state and private.

(9) Enterprise Unit - Budworm infestation on this unit more than doubled in extent and intensity in 1949. The infestation occurs in stands of variable character - some are currently valuable timber stands; others are second-growth stands that are developing for the future; and still others are stands valuable chiefly for watershed protection and recreational uses.

The total infested area is 411,320 acres. Control on 64,190 acres of heavily infested timber in three main blocks - Wallowa, Joseph and Day Ridge - is recommended for 1950. Ownership of the area proposed for control is 51.1 percent (32,830 acres) national forest and 48.9 percent (31,360 acres) state and private.

(10) Chesnimnus Unit - The budworm outbreak on this unit became markedly worse in 1949. At present a total of 112,660 acres of mixed fir that is highly valuable to the local economy is infested. Control on 81,850 acres in a single block is recommended for 1950. Ownership of the area proposed for control is 84.5 percent (69,090 acres) national forest, 0.05 percent (40 acres) public domain, and 15.5 percent (12,720 acres) state and private.

(11) John Day Unit - Some 136,690 acres of mixed fir forest on and adjacent to the Malheur National Forest are relatively lightly defoliated by the budworm. Ownership of the infested area is approximately 60.8 percent (83,110 acres) national forest and 39.2 percent (53,580 acres) state and private. Because of the urgent needs elsewhere in the region, no control on the John Day unit is recommended for 1950.

(12) Ochoco Unit - A total of 13,850 acres of relatively low quality mixed fir on and adjacent to the Ochoco National Forest is lightly infested with the budworm. Ownership of the infested area is 91 percent state and private and 9 percent national forest. No control is recommended for 1950.

Blue Mountains Area - Washington

The one control unit on this area is in effect a continuation of the North Umatilla unit. It is set up separately for administrative reasons to include the budworm - infested timber in the State of Washington. The value of the infested timber is estimated to be $2,555,000 on the same basis as for the remainder of the Blue Mountains region.

(13) Walla Walla Unit - The fir stands on the Walla Walla unit, like those on the South and North Umatilla units, are critically infested. Much of the infested area is quite rough. It is of greatest value as a watershed for such communities as Walla Walla, Milton - Freewater and Dayton. Loss of the infested forest would be a very severe blow to these communities.

Budworm infestation on the Walla Walla unit totals 170,320 acres. Control on 40,050 acres is recommended for 1950. Ownership of the area proposed for control is 30.7 percent (12,290 acres) national forest, 0.2 percent (80 acres) public domain, and 69.1 percent (27,680 acres) state and private.

TABLE 1.

SUMMARY OF SPRUCE BUDWORM SITUATION
IN OREGON AND WASHINGTON

AREA	Infested Acreage			Spraying Schedule	
	Light (Acres)	Heavy (Acres)	Total (Acres)	1950 (Acres)	1951 & Later (Acres)
WESTERN OREGON					
(1) McKenzie-Willamette	53,920	14,240	68,160	68,160	
(2) Eugene-Oakridge	8,800	1,440	10,240	10,240	
(3) Roseburg	9,760	480	10,240	10,240	
TOTAL	72,480	16,160	88,640	88,640	
EASTERN OREGON CASCADES					
(4) Mt. Hood	32,990		32,990	32,990	
(5) Deschutes	7,000		7,000	7,000	
TOTAL	39,990		39,990	39,990	
BLUE MOUNTAINS-OREGON					
(6) South Umatilla	193,410	295,960	489,370	295,960	193,410
(7) North Umatilla	227,480	288,940	516,420	288,940	227,480
(8) LaGrande	187,970	100,050	288,020	100,050	187,970
(9) Enterprise	347,130	64,190	411,320	64,190	347,130
(10) Chesnimnus	30,810	81,850	112,660	81,850	30,810
(11) John Day	136,690		136,690		136,690
(12) Ochoco	13,850		13,850		13,850
TOTAL	1,137,340	830,990	1,968,330	830,990	1,137,340
TOTAL FOR OREGON	1,249,810	847,150	2,096,960	959,620	1,137,340
BLUE MOUNTAINS-WASHINGTON					
(13) Walla Walla	130,270	40,050	170,320	40,050	130,270
GRAND TOTAL	1,380,080	887,200	2,267,280	999,670	1,267,610

TABLE 2. PROPOSED PROGRAM FOR SPRUCE BUDWORM CONTROL IN 1950
BY OWNERSHIPS AND AREAS

AREA	FEDERAL					STATE & COUNTY		PRIVATE		GRAND TOTAL
	Nat'l. Forest Acres	Public Domain & O&C Acres	Indian Reservations Acres	Total Acres	Percent of Total	Acres	Percent of Total	Acres	Percent of Total	Acres
WESTERN OREGON										
(1) McKenzie-Willamette	68,160			68,160	100.0					68,160
(2) Eugene-Oakridge	5,440	2,100		7,540	73.6			2,700	26.4	10,240
(3) Roseburg		640		640	6.3	20	0.1	9,580	93.6	10,240
TOTAL	73,600	2,740		76,340	86.1	20	0.1	12,280	13.8	88,640
EASTERN OREGON CASCADES										
(4) Mt. Hood	7,000		25,520	32,520	98.6			470	1.4	32,990
(5) Deschutes	6,070			6,070	86.7			930	13.3	7,000
TOTAL	13,070		25,520	38,590	96.5			1,400	3.5	39,990
BLUE MOUNTAINS-OREGON										
(6) South Umatilla	178,940	4,060		183,000	61.9	340	0.1	112,620	38.1	295,960
(7) North Umatilla	177,850	1,250	1,710	180,810	62.6	1,310	0.4	106,820	37.0	288,940
(8) LaGrande	51,970	1,150		53,120	53.1	180	0.2	46,750	46.7	100,050
(9) Enterprise	32,830			32,830	51.1			31,360	48.9	64,190
(10) Chesnimnus	69,090	40		69,130	84.5			12,720	15.5	81,850
(11) John Day										
(12) Ochoco										
TOTAL	510,680	6,500	1,710	518,890	62.4	1,830	0.2	310,270	37.4	830,990
TOTAL FOR OREGON	597,350	9,240	27,230	633,820	66.0	1,850	0.2	323,950	33.8	959,620
BLUE MOUNTAINS-WASHINGTON										
(13) Walla Walla	12,290	80		12,370	30.9	2,080	5.2	25,600	63.9	40,050
GRAND TOTAL	609,640	9,320	27,230	646,190	64.6	3,930	0.4	349,550	35.0	999,670

TABLE 3. PROPOSED APPORTIONMENT OF COSTS FOR SPRUCE BUDWORM CONTROL IN 1950

AREA	FEDERAL CONTRIBUTIONS			STATE CONTRIBUTIONS			PRIVATE CONTRIBUTIONS	GRAND TOTAL
	For U.S. Lands (100%)	For Private Lands (25%)	TOTAL	State & County (100%)	For Private Lands (50%)	TOTAL	For Private Lands (25%)	
WESTERN OREGON	$	$	$	$	$	$	$	$
(1) McKenzie-Willamette	81,792		81,792					81,792
(2) Eugene-Oakridge	9,048	810	9,858		1,620	1,620	810	12,288
(3) Roseburg	768	2,874	3,642	24	5,748	5,772	2,874	12,288
TOTAL	$ 91,608	$ 3,684	$ 95,292	$ 24	$ 7,368	$ 7,392	$ 3,684	$ 106,368
EASTERN OREGON CASCADES								
(4) Mt. Hood	$ 39,024	$ 141	$ 39,165	$	$ 282	$ 282	$ 141	$ 39,588
(5) Deschutes	7,284	279	7,563		558	558	279	8,400
TOTAL	$ 46,308	$ 420	$ 46,728	$	$ 840	$ 840	$ 420	$ 47,988
BLUE MOUNTAINS-OREGON								
(6) South Umatilla	$219,600	$ 33,786	$253,386	$ 408	$ 67,572	$ 67,980	$ 33,786	$ 355,152
(7) North Umatilla	216,972	32,046	249,018	1,572	64,092	65,664	32,046	346,728
(8) LaGrande	63,744	14,025	77,769	216	28,050	28,266	14,025	120,060
(9) Enterprise	39,396	9,408	48,804		18,816	18,816	9,408	77,028
(10) Chesnimnus	82,956	3,816	86,772		7,632	7,632	3,816	98,220
(11) John Day								
(12) Ochoco								
TOTAL	$622,668	$ 93,081	$715,749	$2,196	$186,162	$188,358	$ 93,081	$ 997,188
TOTAL FOR OREGON	$760,584	$ 97,185	$857,769	$2,220	$194,370	$196,590	$ 97,185	$1,151,544
BLUE MOUNTAINS-WASHINGTON								
(13) Walla Walla	$ 14,844	$ 7,680	$ 22,524	$2,496	$ 15,360	$ 17,856	$ 7,680	$ 48,060
GRAND TOTAL	$775,428	$104,865	$880,293	$4,716	$209,730	$214,446	$104,865	$1,199,604

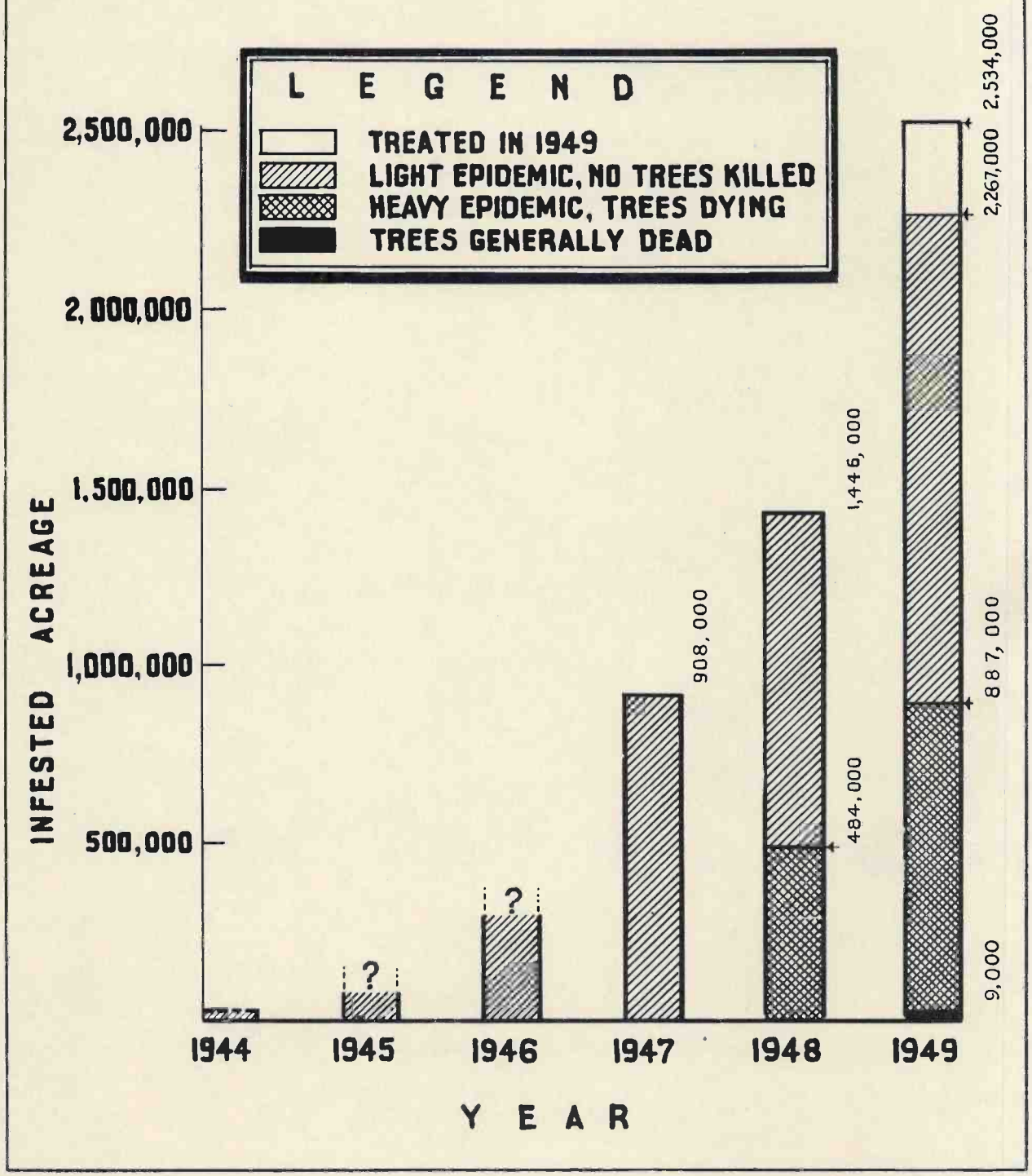
TABLE 4.

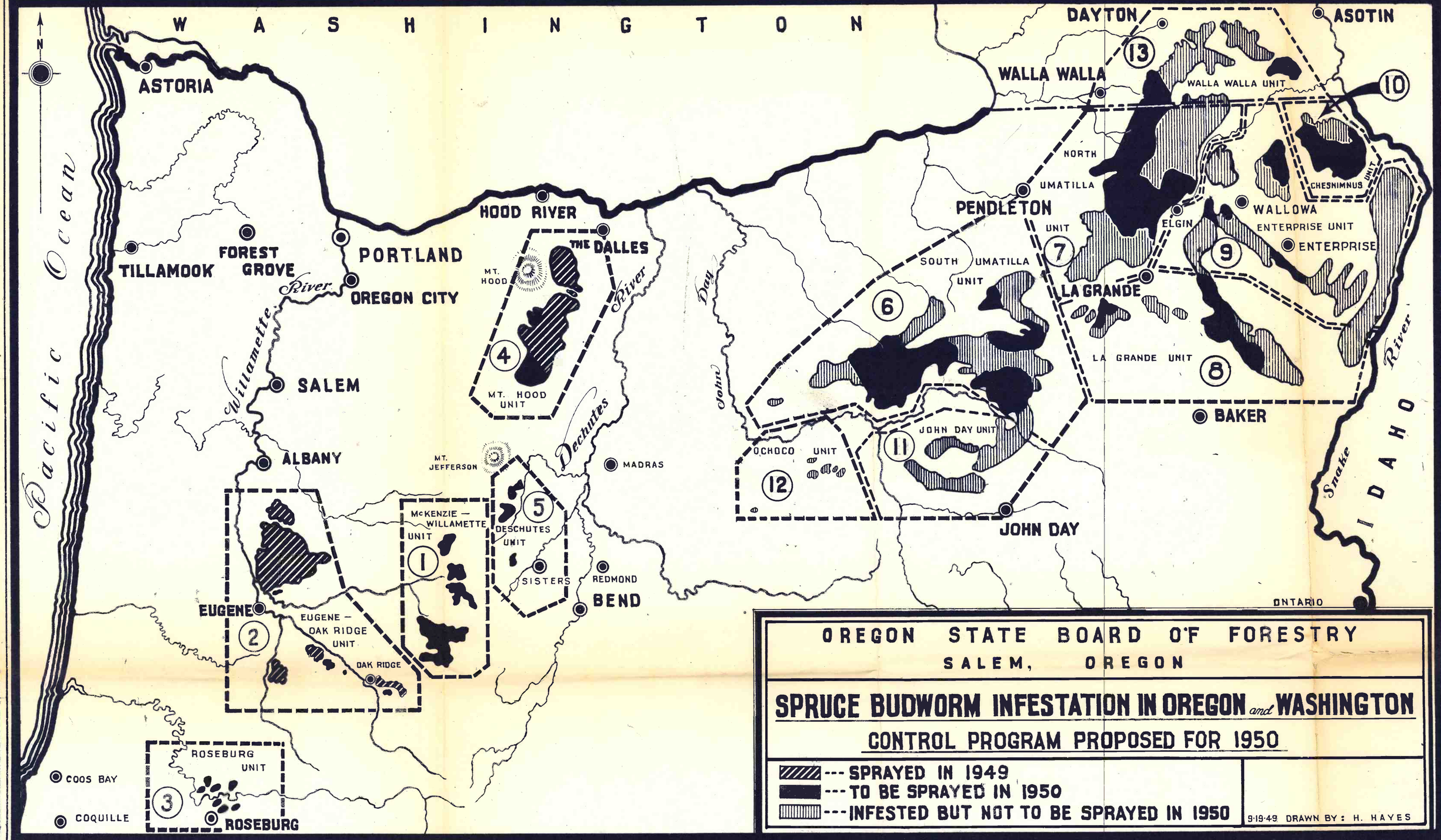
PROPOSED PROJECT ADMINISTRATION FOR SPRUCE BUDWORM CONTROL IN 1950

ADMINISTRATIVE AGENCY	AREA	FEDERAL TOTAL ACRES	PERCENT OF TOTAL	STATE & COUNTY TOTAL ACRES	PERCENT OF TOTAL	PRIVATE TOTAL ACRES	PERCENT OF TOTAL	TOTALS
U. S. Government	(1) McKenzie-Willamette	68,160	100.0					68,160
" " "	(4) Mt. Hood	32,520	98.6			470	1.4	32,990
" " "	(5) Deschutes	6,070	86.7			930	13.3	7,000
" " "	(7) North Umatilla	180,810	62.6	1,310	0.4	106,820	37.0	288,940
" " "	(10) Chesnimnus	69,130	84.5			12,720	15.5	81,850
" " "	(13) Walla Walla	12,370	30.9	2,080	5.2	25,600	63.9	40,050
	TOTAL ACRES	369,060	71.1	3,390	0.6	146,540	28.3	518,990
State of Oregon	(2) Eugene-Oakridge	7,540	73.6			2,700	26.4	10,240
" " "	(3) Roseburg	640	6.3	20	0.1	9,580	93.6	10,240
" " "	(6) South Umatilla	183,000	61.8	340	0.1	112,620	38.1	295,960
" " "	(8) LaGrande	53,120	53.1	180	0.2	46,750	46.7	100,050
" " "	(9) Enterprise	32,830	51.1			31,360	48.9	64,190
	TOTAL ACRES	277,130	57.6	540	0.1	203,010	42.3	480,680
	GRAND TOTAL	646,190	64.6	3,930	0.4	349,550	35.0	999,670

C H A R T I

PROGRESS OF SPRUCE BUDWORM EPIDEMIC IN OREGON AND WASHINGTON.





OREGON STATE BOARD OF FORESTRY

SALEM, OREGON

SPRUCE BUDWORM INFESTATION IN OREGON and WASHINGTON

CONTROL PROGRAM PROPOSED FOR 1950

--- SPRAYED IN 1949

--- TO BE SPRAYED IN 1950

--- INFESTED BUT NOT TO BE SPRAYED IN 1950

9-19-49 DRAWN BY: H. HAYES